Accelerator Systems Division Highlights Ending September 9, 2005

Installation

Craft Snapshot 9/6/05

ASD productive craft workers	51.0
Foremen (Pd by 15% OH)	6.0
HSM management (Pd directly)	3.0
TOTAL AMSI WORKERS	60.0
Less WBS 1.9, 1.2 etc	9.0
Less absent	2.0
TOTAL PD BY ASD/ORNL DB WPs	40.0

Accelerator Physics

- 24x7 SCL beam commissioning continues. A number of accelerator physics studies have been performed. This week we compared two methods for setting the SCL cavity phases, one based on BPM measurements and another on the beam induced signal in an unpowered cavity. These methods give good agreement for 20 mA peak currents. We delivered beam pulses of 2x10^13 ions/pulse to the linac dump at 910 MeV during 2K operation.
- A retune of the SC linac was performed following the maintenance day. The new output beam energy is 900 MeV.

Operations

Ion Source

- After ~55 days of operation, the Front-End ion source was cesiated for the 3rd time, increasing the MEBT beam current to 38 mA with a peak current of 45 mA. These currents are for 0.04 ms long pulses at a 1 Hz. It has gradually become difficult to find a combination of ion source parameters that allow for heating the ion source collar to the required 550 C. When baseline parameters are used the plasma goes out when the rep rate is raised to ~ 20 Hz.
- 60% of high priority spares and long-lead tools have been readied for purchase in early October. This represents about 80% of the $ value.

Survey and Alignment

RTBT:

- Rad-hard mock-up stand rails leveled.
- QV13, QH14, QV15, QH20, and QV21 final alignment.

TARGET:

- BL13 shutter insert stand leveled.
- BL13 bielick fixture set on stand and baseline set out on stand and floor.
- Meeting with Swiss Neutronics technicians about their requirements from S&A.
- Work with Swiss Neutronics technicians for BL13 shutter insert completed.
- BL13 shutter tray sphere mount related to BSL fiducials.
- BL13 shutter alignment with new fixture (work stopped due to possible damage to insert mounting fixtures).
- BL13 shutter insert guide alignment checked by observing scribe marks placed by Swiss Neutronics.
- Initial Target floor elevation monitoring underway today 9/9/05.

Magnet Measurement:

- Re-leveled extraction dump dipole antenna (work stopped due to hardware requirement… shims on order).
- Align (straighten) extraction dump dipole antenna.
- Align test 30Q58 to extraction dump dipole antenna.

RTBT

- 21Q40 Magnets aligned all the way through QV19

Mechanical

Water Systems Installation

- Characterization of the Ring half-cells water circuits' flow continued.
- A second flexible coupling failure in the Ring magnet cooling skid was repaired and the system placed back into operation.
- The Ring magnet cooling skid backup pump was aligned and placed into operation.
- Fabrication of the RTBT/Target Quad cooling manifold continued.
- Preventative Maintenance on the Linac water systems continued

Ring Systems Installation

- The HEBT Laser Stripping experiment magnets were assembled.
- The Ring Collimator straight section beamline from Collimator #3 thru the QMM/Tune Kicker assy was leak checked and a QMM feedthrough replaced.
- The Ring Extraction straight section kickers were surveyed and the chambers sealed back up.
- The RTBT beamline sector gate valve SGV02 was installed.
- The RTBT beamline from magnet QV03 through QV05 assembly was installed.
- The RTBT magnet QV13, QH14 and QV15 assemblies were aligned.
- The RTBT magnet QH20 and QV21assemblies were aligned.
- The RTBT EDUMP magnet QV01 and QH02 assemblies were installed.
- The RTBT/Target quad magnets' tunnel rail supports were grouted
- The RTBT/Target quad magnets' tunnel utility installation continued

Magnets

- Two RTBT 30Q assemblies went to the tunnel for installation.
- We are using another 30Q58 to check out the measurement coil that will be used for mapping the RTBT Dipole.
- We also helped assemble the Russian Laser Stripping Dipoles.

Electrical

RF

Linac HPRF

- Examined the features for an RFTF extension needed for the power upgrade based on users input from Cryo, HVCM and RF. Prepared presentation for management.
- Tested the Thales 402 MHz klystron in the RFTF. Measured peak power, emission curve, bandwidth and harmonics. Peak power appears low, 2300 kW vs 2500 kW specified. We are revisiting test stand calibration and verifying with calorimetry.
- The NC transmitter PLC programs were upgraded to turn on magnet power supplies when the filaments were turned on. Also, a software filter was inserted in the cooling water flow data stream to prevent trips from momentary flow aberrations.

Ring RF

- We have simultaneously operated all station power supplies at their nominal settings.
- About 60 % complete with the checkout of Station RF21.
- We have just reached the point of delivering RF power to the cavity. Anticipate RF power in the next few working days.
- Initial RF Power testing will be completed with the station in Local Control and with Low Level RF functions provided by a mobile control center.
- We have the mobile control center operational.

LLRF

- Upgraded the Field Control Module firmware and software to increase loop gain, modify regulation error detection, and improve beam loading compensation.
- Discovered a compatibility problem (between versions) with the FPGA compilation and synthesis tool for the High-power Protection Module. Reverted to firmware generated by old tool set and redeployed code throughout Linac.
- Continued Linac beam commissioning support and installation support for Ring Diagnostics.

Cryo Systems

Beam Diagnostics

BPM

- All of ring BPMs cables are phase matched, about 70% of cables are terminated in the ring tunnel
- 4 sets of BPMs cables need to be phase matched in the HEBT tunnel
- Discovered a problem with the connection to the BPM electrodes. mechanical group is investigating a solution
- List of software changes was submitted to software support. No progress to report yet.
- 9 chassis are ready for installation in the ring service building
- BNL electronics will be installed in HEBT service building to test software and hardware

Wire Scanners:

BLMs

BCM

Video